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| 10/625,737 | 07/24/2003 | Koji Dairiki | 0756-7176 | 8059 |

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| EXAMINER | |
|---|---|
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/625,737 | DAIRIKI, KOJI | |
| | Examiner | Art Unit | |
| | Bac H. Au | 2822 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *29 May 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) *2,4,6,8,10 and 12-18* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,5,7,9,11 and 19-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 09/970,908.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Response to Amendment*

1. Applicant's amendment filed on May 29, 2008, in which claims 1, 3, 5, and 19-21 were amended, has been entered.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 3, 5, 7, 9, 11 and 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakurai (U.S. Pat. 6,333,493) in view of Ballantine (U.S. Pat. 6,105,274) and Buchner (U.S. Pub. 2002/0008098).

Regarding claims 1, 3, 5, 7, 9, 11 and 19-21, Sakurai discloses a heat treatment method comprising the step of:

holding a treatment substrate [1 of Fig.1] in a processing chamber;

heating the treatment substrate by irradiating it with a radiation from a lamp light source which is held for 0.1 to 20 seconds [Col. 7 lines 8-15; col.12 line 65 - col.13 line 3; col.9 lines 14-20 discloses the input voltage is controlled at an interval of 0.5 seconds so as to stabilize the temperature with the temperature set in advance by the control device];

cooling the treatment substrate;

wherein the radiation from said lamp light source is repeated several times [Col. 1, lines 65-67, col. 2, lines 1-5, col. 8, lines 48-60, col. 9, lines 25-30, col. 11, lines 23-30, col. 13, lines 53-57, col. 18, lines 20-35, col. 19, lines 5-18, col. 22, lines 13-35, col. 24, lines 23-37, col. 25, lines 5-10];

wherein said lamp light source is selected from the group consisting of a halogen lamp, a metal halide lamp, a xenon lamp, a high pressure mercury lamp, a high pressure sodium lamp and an excimer lamp [Col.7 lines 8-14].

Sakurai fails to disclose

heating while supply of a first inactive gas is kept in the processing chamber so that the first inactive gas passes along an irradiated surface of the treatment substrate and a surface opposite to the irradiated surface of the treatment substrate;

wherein the temperature drop rate of the treatment substrate is 50 to 150°C per second in the cooling step, while supply of a second inactive gas is kept in the processing chamber so that the second inactive gas passes along the irradiated surface of the treatment substrate and the surface opposite to the irradiated surface of the treatment substrate;

wherein the amount of supply of the second inactive gas during cooling is larger than the amount of supply of the first inactive gas during heating; and

wherein each of the first inactive gas and the second inactive gas comprises at least one of nitrogen or helium.

However, Ballantine is presented as evidence to show that holding the treatment substrate in a processing chamber, while supply of an inactive gas (a coolant) is kept in the processing chamber, is conventional in the art. Ballantine [Abstract, col. 2, lines 27-67, col. 3, lines 1-65, col. 4, lines 1-67, col. 5, lines 1-32, 50-63] discloses holding the treatment substrate in a processing chamber, while supply of a first inactive gas is kept in the processing chamber, wherein each of the first inactive gas (coolant) and the second inactive gas (coolant) comprises at least one of nitrogen or helium, and increasing or decreasing the amount of the second inactive gas wherein the temperature drop rate of the treatment substrate is 50 to 150°C per second [Col.4 lines 24-32, lines 44-49]. Ballantine discloses keeping the supply of the inactive gas at any desired point, before, during, and/or after heating the treatment substrate [Col. 3, lines 62-67; col. 4, lines 25-67]. Ballantine [Col.4 lines 4-6; col.5 lines 5-10] discloses directing first and second inactive gas to the whole substrate, including the upper and/or lower surface of the treatment substrate.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Ballantine into the method of Sakurai to include the limitations discussed. The ordinary artisan would have been motivated to modify Sakurai by applying an inactive gas to the treatment substrate and the inactive gas being nitrogen or helium as taught by Ballantine in order to minimize the time that the substrate stays at undesirable temperatures [Ballantine; col. 3 lines 10-20].

Ballantine [Col.2 lines 52-58] discloses ramping up the temperature as quickly as possible in heat treating a substrate, and then cooling the substrate as quickly as possible. Sakurai and Ballantine fail to explicitly disclose wherein a temperature rise rate of the treatment substrate is 100 to 200°C per second, in the irradiatinq the treatment substrate with radiation from the lamp light source.

However, Buchner [Para.17] discloses wherein a temperature rise rate of the treatment substrate is 100 to 200°C per second, in the irradiatinq the treatment substrate with radiation from the lamp light source. It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Buchner into the method of Sakurai and Ballantine to provide wherein a temperature rise rate of the treatment substrate is 100 to 200°C per second, in the irradiatinq the treatment substrate with radiation from the lamp light source.

The ordinary artisan would have been motivated to modify Sakurai and Ballantine in the manner set forth above for at least the purpose of ramping up the temperature as quickly as possible in heat treating a substrate to avoid undesirable reactions that occur at lower temperatures [Ballantine; col.2 lines 52-58].

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where

the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 1, 3, 5, 7, 9, 11 and 19-21 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 13-24 U.S. Patent No. 7179729 in view of Ballantine (U.S. Pat. 6,105,274) and Buchner (U.S. Pub. 2002/0008098). Claims 13-24 of '729 disclose most of the limitations of the claims, but fail to disclose wherein a temperature rise rate of the treatment substrate is 100 to 200°C per second, while supply of a first inactive gas is kept in the processing chamber so that the first inactive gas passes along an irradiated surface of the treatment substrate and a surface opposite to the irradiated surface of the treatment substrate; wherein the temperature drop rate of the treatment substrate is 50 to 150°C per second in the cooling step, while supply of a second inactive gas is kept in the processing chamber so that the second inactive gas passes along the irradiated surface of the treatment substrate and the surface opposite to the irradiated surface of the

treatment substrate. However, Ballantine [Col.4 lines 24-49] discloses wherein the temperature drop rate of the treatment substrate is 50 to 150°C per second. Ballantine discloses keeping the supply of the inactive gas at any desired point, before, during, and/or after heating the treatment substrate [Col. 3, lines 62-67; col. 4, lines 25-67]. Ballantine [Col.4 lines 4-6; col.5 lines 5-10] discloses directing the inactive gas to the whole substrate, including the upper and/or lower surface of the treatment substrate. It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Ballantine into the method of '729 to include the limitations discussed. The ordinary artisan would have been motivated to modify '729 by applying an inactive gas to the treatment substrate in order to minimize the time that the substrate stays at undesirable temperatures [Ballantine; col. 3 lines 10-20].

Ballantine [Col.2 lines 52-58] discloses ramping up the temperature as quickly as possible in heat treating a substrate, and then cooling the substrate as quickly as possible. '729 and Ballantine fail to explicitly disclose wherein a temperature rise rate of the treatment substrate is 100 to 200°C per second, in the irradiatinq the treatment substrate with radiation from the lamp light source.

However, Buchner [Para.17] discloses wherein a temperature rise rate of the treatment substrate is 100 to 200°C per second, in the irradiatinq the treatment substrate with radiation from the lamp light source. It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Buchner into the method of '729 and Ballantine to provide wherein a temperature rise rate of the treatment substrate is 100 to

200°C per second, in the irradiatinq the treatment substrate with radiation from the lamp light source.

The ordinary artisan would have been motivated to modify '729 and Ballantine in the manner set forth above for at least the purpose of ramping up the temperature as quickly as possible in heat treating an substrate to avoid undesirable reactions that occur at lower temperatures [Ballantine; col.2 lines 52-58].

Claims 1 and 19 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 14 and 20 of U.S. Patent No. 6759313 in view of Ballantine (U.S. Pat. 6,105,274) and Buchner (U.S. Pub. 2002/0008098). Claims 14 and 20 of '313 discloses most of the limitations of the claims, but fails to disclose wherein a temperature rise rate of the treatment substrate is 100 to 200°C per second, in the irradiatinq the treatment substrate with radiation from the lamp light source, while supply of a first inactive gas is kept in the processing chamber so that the first inactive gas passes along an irradiated surface of the treatment substrate and a surface opposite to the irradiated surface of the treatment substrate; and wherein the temperature drop rate of the treatment substrate is 50 to 150°C per second in the cooling step, while supply of a second inactive gas is kept in the processing chamber so that the second inactive gas passes along the irradiated surface of the treatment substrate and the surface opposite to the irradiated surface of the treatment substrate. However, Ballantine [Col.4 lines 24-49] discloses wherein

the temperature drop rate by the supply of the inactive gas is 50 to 150°C per second. Ballantine discloses keeping the supply of the inactive gas at any desired point, before, during, and/or after heating the treatment substrate [Col. 3, lines 62-67; col. 4, lines 25-67]. Ballantine [Col.4 lines 4-6; col.5 lines 5-10] discloses directing the inactive gas to the whole substrate, including the upper and/or lower surface of the treatment substrate. It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Ballantine into the method of '313 to include the limitations discussed. The ordinary artisan would have been motivated to modify '313 by applying an inactive gas to the treatment substrate in order to minimize the time that the substrate stays at undesirable temperatures [Ballantine; col. 3 lines 10-20].

Buchner [Para.17] discloses wherein a temperature rise rate of the treatment substrate is 100 to 200°C per second, in the irradiatinq the treatment substrate with radiation from the lamp light source, as already discussed above.

### *Response to Arguments*

4. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection. The claims stand rejected and the Action is made Final.

***Conclusion***

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bac H. Au whose telephone number is 571-272-8795. The examiner can normally be reached on Mon-Fri 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zandra Smith can be reached on 571-272-2429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/B. H. A./
Examiner, Art Unit 2822

/Michael Trinh/
Primary Examiner, Art Unit 2822